

S/190/60/002/010/006/026
B004/B054

AUTHORS: Basin, V. Ye., Shvarts, A. G.
TITLE: Determination of the Density of Cohesion Energy of Some Synthetic Rubbers
PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 10, pp. 1470-1474

TEXT: The authors determined the density of cohesion energy of the following rubber types (Table 1): 1) Divinyl styrene rubbers of the types $CKC-30A$ (SKS-30A, 25.4% of styrene) and $CKC-30\omega\chi\pi$ (SKS-30ShKhP, 28% of styrene); 2) divinyl methyl vinyl pyridine rubbers of the types $CKMB\pi-5mp$ (SKMVP-5tr, 21% of styrene and 3.5% of 2-methyl-5-vinyl pyridine) and $CKMB\pi-15A$ (SKMVP-15A, 12.5% of 2-methyl-5-vinyl pyridine); 3) carboxyl-containing rubbers: types $CK\Delta-1$ (SKD-1, 1.5% of methacrylic acid) and $CKC-30-1$ (SKS-30-1, 28% of styrene and 1.25% of methacrylic acid). The composition of the vulcanizates is given in Table 2. Rubber samples were swelled in paraffin oil, and their elongation measured as a function of stress (50-200 g). R. Rivlin's (Ref. 2) equation is written down:

$$\Phi = 0.5 \cdot f \cdot A_0^{-1} \cdot v_2^{1/3} (\lambda - \lambda^{-2})^{-1} \quad (1), \text{ where } f \text{ is the load, } A_0 \text{ the cross}$$

Card 1/3

Determination of the Density of Cohesion Energy of Some Synthetic Rubbers S/190/60/002/010/006/026
B004/B054

section of the non-swelled sample, v_2 the volume fraction of the rubber in the swelled vulcanizate. The number of cross links in the vulcanizate is determined from this function: $\Phi = c_1 + \lambda^{-1} \cdot c_2 = 0.5 \cdot q_r \cdot M_c^{-1} \cdot RT$ (2);

q_r is the rubber density, M_c the molecular weight of the chain between the space lattice points, c_1 , c_2 are constants. c_1 is determined by graphic extrapolation of this function for $\lambda = 0$: $c_1 \text{ exper.} = 0.5 q_r RT M_c^{-1}$ (3). The values for v_2 , c_1 , c_2 , and M_c are given in Table 3. The swelling equilibri-

um Q and the parameter μ were determined according to P. Flory (Ref. 4) (Table 4); the solubility parameter δ was represented as a function of $\sqrt{(\mu - 0.25)/v_s}$ (Fig.), where v_s is the molar volume of the solvent. The

densities of cohesion energy of the rubbers mentioned, as well as of the formerly studied types $HK(NK)$, $CKM(SKI)$, and $CKB(SKB)$, are given in Table 5. They lie between 68 and 75 cal/cm². An introduction of 2-methyl-5-vinyl pyridine groups increases the oil resistance of the rubber, as well as the vulcanization with polychloro compounds (benzotrithloride). An introduction of carboxyl groups increases the cohesion energy, but it has, like metal oxides, little effect on the interaction between rubber

Card 2/3

Determination of the Density of Cohesion
Energy of Some Synthetic Rubbers

S/190/60/002/010/006/026
B004/B054

and solvent. V. A. Grigorovskaya assisted in the experiments. There are
1 figure, 5 tables, and 5 references: 2 Soviet, 1 US, and 2 British.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti
(Scientific Research Institute of the Tire Industry)

SUBMITTED: March 30, 1960

Card 3/3

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3/138/60/000/008/002/015

A051/A029

// 2211

AUTHORS: Shvartz, A.G.; Kamenskiy, B.Z.; Eytingon, I.I.

TITLE: The Vulcanization of Rubbers Using Synthetic Resins

PERIODICAL: Kauchuk i Rezina, 1960, No. 8, pp. 5 - 9

TEXT: Based on previously successful attempts at vulcanizing natural rubber with synthetic resins, such as those described in Refs. 1 - 13, the authors investigated the possibilities of using Soviet-produced resins for vulcanizing butyl rubber, natural rubber, CKC-30AM (SKS-30AM) and CKH-26 (SKN-26), where the industrial resin 101 was chosen as the vulcanizing agent. The latter is the product of the alkaline condensation of n-tertiary butylphenol and formaldehyde. Amterol CT -137 (ST-137), the condensation product of n-octylphenol and formaldehyde was taken as the second vulcanizing agent for comparative purposes. The practical application of the alkylphenolformaldehyde resins as vulcanizing agents of butadiene-nitrile rubber was introduced only recently and is described in the works of A.S. Novikov, I.A. Skub and K.F. Kaluzhenina (Works of the NIIRP, No. 3, Goskhimizdat 1956.). The improvement in the qualities of the vulcanizates obtained by using the resins in vulcanizing butyl rubbers is explained by the formation of transverse

Card 1/3

87917

S/138/60/000/008/002/015
A051/A029

The Vulcanization of Rubbers Using Synthetic Resins

bonds of the -C-C- and -C-C-C- type, which are more resistant to thermomechanical action than the -C-S-C- and -C-S-C- bonds (Ref. 6). Data already available showed that rubber vulcanized with alkylphenolformaldehyde resins as a result of their high thermal stability of the transverse bonds formed do not exhibit a tendency to vulcanization reversion and changes in the values of the residual expansion in aging, neither in prolonged vulcanization periods nor at temperature increases. These latter qualities render the rubber applicable to manufacturing goods which maintain constant dimensions at high temperatures. The results of the authors' experiments using these resins showed that the alkylphenolformaldehyde resins of alkaline condensation could be used for vulcanizing various rubbers. The rubbers obtained by this vulcanization were found to be more resistant to thermomechanical action than those vulcanized with sulfur in the usual way. In using the resin 101 as the vulcanizing agent, chlorine compounds were applied as activators. Rubbers based on natural rubber oil butadiene-styrene (SKS-30AM) and butadiene nitrile (SKN-26) rubbers, vulcanized with alkylphenolformaldehyde resins, were also found to have a higher aging resistance than those vulcanized with sulfur. Their dynamic properties do not drop and the stability of adhesion at the interface of doubled rubber increases. Finally, the latter rubber has more resistance to creeping than those vulcanized with sulfur. It was also concluded that the properties of

Card 2/3

87917

S/138/60/000/008/002/015

A051/A029

The Vulcanization of Rubbers Using Synthetic Resins

the rubbers with resins based on n-tertiary butylphenol (resin 101) are somewhat inferior to those based on n-octylphenol (resin Amberol St-137) in their properties. The results showed that the study of vulcanization using alkylphenolformaldehyde resins is very promising for the production of thermo-resistant rubbers. There are 7 tables, 4 graphs, 13 references: 2 Soviet, 8 English, 2 French, 1 German.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry)

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Card 3/3

REYISBEK, Kh.Ye. [Rallsbeck, H.E.]; BIARD, Ch.Ch., KHOZ, Dzh.R. [Hose, J.R.]
SHVARTS, A.G.; Buyko, G.M. [translators]

Compounding the compositions of mixtures based on cis-1, 4-polybutadiene. Kauch.i rez. 19 no.7:53-64 JI '60. (MIRA 13:7)
(Polymers) (Butadiene)

SHVARTS, A.G.; KAMENSKIY, B.Z.; BYTINGON, I.I.

Vulcanization of rubber by means of synthetic resins. Kauch.
i rez. 19 no.8:5-9- 4g '60. (MIRA 13:8)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.
(Vulcanization) (Resins, Synthetic)

SHVARTS, A. G.

Cand Tech Sci - (diss) "General principles of cutting rubber made from synthetic isoprene caoutchouc (SKI) for motor vehicle tires." Moscow, 1961. 18 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Moscow Inst of Fine Chemical Technology imeni M. V. Lomonosov); 225 copies; price not given; list of author's works on pp 17-18 (12 entries); (KL, 7-61 sup, 249)

SHVARTS A.G.

SHVARTZ, A.G., FROLIKOVA, V.G., TYURINA, V.S., ALEKSANDROV, V.V.,
BOGUSLAVSKIY, D.B.

Perfecting the rubber mixture composition, based on butyl rubber,
for diaphragms in the formator-vulcanizers.

Report submitted for the 4th Scientific Research conference on the Chemistry
and technology of synthetic and natural rubber. Yaroslavl, 1962

YEVSTRATOV, V.F., kand.khim.nauk; SHVARTS, A.G.

New synthetic rubbers. Zhur.VKHO 7 no.2:172-180 '62.
(MIRA 15:4)

(Rubber, Synthetic)

VASIL'YEV, G.Ya.; SHVARTS, A.G.; SEROV, I.A.; MESROPOV, Yu.D.; Prinipli
uchastie: BARANOV, S.B.; BISEROVA, A.A.; GINZBURG, L.V.;
GGROKHOV, N.D.; KARAPETYAN, D.A.; KEPERSHA, L.M.; MAMEDOVA, M.M.

Manufacture of diaphragms at the Baku tire factory. Kauch.i rez.
21 no.1:45-47 Ja '62. (MIRA 15:1)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti
i Bakinskiy shinnyy zavod.
(Baku—Tires, Rubber)

SHVARTS, A.G.; KAMENSKIY, B.Z.

Rubber vulcanization with phenol alkyl formaldehyde resins.
Kauch.i rez. 22 no.2:8-14 F '63. (MIRA 16:2)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.
(Phenol condensation products)
(Vulcanization)

SHVARTS, A.G.; EYTINGON, I.I.; FROLIKOVA, V.T.; STREL'NIKOVA, N.P.

Some requirements for alkylphenol-formaldehyde resins used for
the vulcanization of butyl rubber. Kauch. i rez. 22 no.10:
17-18 0 '63. (MIRA 16:11)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.

ACCESSION NR: AP4034470

S/0138/64/000/004/0015/0019

AUTHORS: Ronkin, G. M.; Levitin, I. A.; Shvarts, A. G.

TITLE: Effect of various ingredients in rubber compounds on the vulcanization of rubbers by alkylphenolformaldehyde resins

SOURCE: Kauchuk i rezina, no. 4, 1964, 15-19

TOPIC TAGS: rubber vulcanization, alkylphenolformaldehyde resin vulcanizer, vulcanization promoter, vulcanization inhibitor, reactive promoter group, methylol group, butyl rubber, rubber SKN 40, rubber SKS 30 RP

ABSTRACT: Studies were conducted on the vulcanization of butyl-, SKN-40-, SKS-30-, Nairit A-, and natural rubber, containing per 100 gm rubber, 10 gm alkylphenol-formaldehyde resin 101K, 60 gm KNAF carbon black, and 1 gm stearic acid. To each of these compounds were added 0.003 mole quantities of one of the 26 investigated ingredients. These additives included vulcanizing agents (such as sulfur or paraquinonedioxime), accelerators (such as thiuram or diphenylguanidine), and antioxidants (such as Neozone D or Product 4010). The samples were worked on laboratory rolls, vulcanized at 161C for 60 minutes, and tested for their physico-mechanical properties. It was found that in the presence of these additives the

Card 1/2

ACCESSION NR: AP4034470

vulcanization rate and the number of cross-links were reduced and the properties of the materials deteriorated. Compounds containing amino or thiol groups proved most deleterious to the vulcanization of rubber by resin 101K. The authors assume that this effect is caused by the interaction between the methylol groups of the resin and the mobile hydrogen atoms of the amino and sulfhydryl groups. The possibility of similar deleterious reactions taking place between the methylol groups of the cord-impregnating resin and the coating-rubber compound is also noted. Orig. art. has: 2 tables, 3 charts, and 2 formulas.

ASSOCIATION: Moskovskiy shinnyy zavod (Moscow Tire Plant)

SUBMITTED: 00

DATE ACQ: 13May64

SUB CODE: CH

NO REF SOV: 002

ENCL: 00

OTHER: 000

Card 2/2

ACCESSION NR: AP4038905

S/0138/64/000/005/0001/0004

AUTHORS: Lyalin, A. A.; Shvarts, A. G.; Buyko, G. N.

TITLE: Application of calculated characteristic properties of rubber mixtures

SOURCE: Kauchuk i rezina, no. 5, 1964, 1-4

TOPIC TAGS: internal friction, rubber plasticity, impregnated mixture, activation energy, polymer, viscous flow, intermolecular interaction, vitrification temperature

ABSTRACT: The temperature dependence of the hardness index and modulus of internal friction in rubber, determined on a Cornfeld instrument, were investigated experimentally. Hardness measurements permit the determination of original rubber plasticity for a specific mixture, and friction measurements shed some light on the heat-generating characteristics of rubber. Both impregnated and nonimpregnated mixtures of various rubber bases: NK, SKI, butyl-300, SKS-30ARM and SKN-26 were investigated (properties of each specimen are given in tabular form). Measurements were made in the temperature range 20-100C, and the results are presented graphically as $\lg \eta$ versus $1/T$ (η - viscosity). The results agree closely with the Arrhenius formula

Card 1/2

ACCESSION NR: AP4038905

$$\eta_T = \eta_0 \cdot e^{U/RT}$$

where η_T - viscosity at absolute temperature T, U - nominal activation energy of polymer in viscous flow, R - gas constant, η_0 - constant. The magnitude of U was calculated for the hardness index of raw mixture specimens and for internal friction modulus. U is found to depend on the nature of the polymer, increasing (in general) with an increase in intermolecular interactions and increase in vitrification temperature. The initial plasticity of the rubber does not affect the temperature dependence of the mixture hardness. Orig. art. has: 5 figures, 2 tables, and 1 formula.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti
(Scientific Research Institute of the Tire Industry)

SUBMITTED: 00

DATE ACQ: 05Jun64

ENCL: 00

SUB CODE: MT

NO REF SOV: 009

OTHER: 002

Card 2/2

L 17564-65 EWT(m)/EWP(j)/T Pc-4 RM
ACCESSION NR: AP4049783

S/0138/64/000/011/0022/0024

AUTHOR: Ronkin, G. M.; Levitin, I. A.; Shvarts, A. G.; Eytingon, I. I.

TITLE: Effect of alkylphenolformaldehyde resins ¹⁵ on the sulfur vulcanization ¹⁵ of butyl rubber ¹⁶ _B

SOURCE: Kauchuk i rezina, no. 11, 1964, 22-24

TOPIC TAGS: butyl rubber, synthetic rubber, sulfur vulcanization, methylol resin, phenol formaldehyde resin

ABSTRACT: It was assumed that the addition of small amounts of methylol-containing resins to mixes of butyl rubber being vulcanized with sulfur would reduce the speed of vulcanization of these mixes and reduce the danger of scorching. Use was made of different commercial resins based on p-tert-butylphenol and p-octylphenol, as well as a technical, low-molecular product of the condensation of phenol with an excess of methylol groups. The addition of small amounts of products containing 12-20% methylol groups gives mixes with a smaller tendency toward scorching and higher physico-mechanical indices of the sulfur vulcanizates from butyl rubber than the addition of large amounts of resins with a small content of methylol groups. The addition of small amounts of phenols with a high

Card 1/2

L 17564-65

ACCESSION NR: AP4049783

2
content of methylol groups to ordinary rubber mixes makes it possible to reduce preliminary structuring of these mixes without a substantial impairment of the properties of the vulcanizates. Orig. art. has: 4 figures and 3 tables.

ASSOCIATION: Moskovskiy shinny*y zavod (Moscow Tire Factory); Nauchnoissledovatel'skiy institut shinnoy promy*shlennosti (Scientific Research Institute of the Tire Industry)

SUBMITTED: 00

ENCL: 00

SUB CODE: MT

NO REF SOV: 003

OTHER: 000

Card

2/2

ADAMOV, A.K.; BULATOVA, T.T.; CHEVACHES, A.G.

Use of antitoxin alizaric suspension agglutinins for a rapid
detection of botulism pathogens. Zhur. mikrobiol., epid. i
immun. 41 no.10:66-70 '64. (MIRA 18:5)

SHVARTS, A.G.; FROLIKOVA, V.G.; ARENZON, N.M.; TYURINA, V.S.

Basic requirements for rubber for the membranes of forming
and vulcanizing units. Kauch. i rez. 23 no.1:24-27 Ja '64.
(MIRA 17:2)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlen-
nosti.

RONKIN, G.M.; LEVITIN, I.A.; SHVARTS, A.G.

Effect of various ingredients of resin mixtures on the vulcanisation of rubbers with alkyl phenol formaldehyde resins. Kauch. i rez. 23 no.4:15-19 Ap'64 (MIRA 17:7)

1. Moskovskiy shinnyy zavod.

LYALIN, A.A.; SHVARTS, A.G.; BUYKO, G.N.

Use of the rated characteristics of rubber compound properties.
Kauch. i rez. 23 no.5:1-4 My '64. (MIRA 17:9)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.

DOGADKIN, B.A.; PAVLOV, N.N.; SHVARTS, A.G.

Effect of cumenyl peroxide on the properties of sulfur
vulcanizates based on polyisoprene rubber SKI-3. Koll.
zhur. 26 no.4:431-435 J1-Ag '64. (MIRA 17:9)

1. Institut tonkoy khimicheskoy tekhnologii imeni Lomonosova
i Nauchno-issledovatel'skiy institut shinnoy promyshlennosti,
Moskva.

RONKIN, G.M.; LEVITIN, I.A.; SHVARTS, A.G.; EYTINGON, I.I.

Effect of alkylphenol formaldehyde resins on sulfur vulcanization
of butyl rubber. Kauch. i rez. 23 no.11:22-24 N '64. (MIRA 18:4)

1. Moskovskiy shinnyy zavod : Nauchno-issledovatel'skiy institut
shinnoy promyshlennosti.

L 45236-65 EWT(m)/EWP(j) Pc-4 RM
ACCESSION NR: AP5010848

UR/0138/65/000/004/0039/0043

18
13
B

AUTHOR: Shvarts, A. G.

TITLE: Use of the swelling method in the study of the properties of various rubbers

SOURCE: Kauchuk i rezina, no. 4, 1965, 39-43

TOPIC TAGS: rubber swelling, rubber mechanical property, swelling method, Huggins constant, rubber solvent interaction

15
ABSTRACT: The swelling method, one of the methods for studying the properties of polymers, rubber mixtures and vulcanizates, has been refined, and a series of practical calculations are presented which permit an evaluation of the properties of samples studied by this method under plant-laboratory conditions. After describing the swelling method, the authors discuss its use in evaluating the properties of polymers and crude rubber mixtures. The choice of a solvent is discussed in terms of the Huggins constant μ , which characterizes the intermolecular interaction between rubber and solvent, and above the critical value of which the polymer is insoluble; the constant μ is determined by the solubility.

Card 1/2

L 45236-65

ACCESSION NR: AP5010848

ity parameters of the polymer and solvent. The best solvent is one whose solubility parameter coincides with that of the polymer; the solubility parameters of various polymers and the values of μ for various rubber - solvent systems are tabulated. The article concludes with a description of the use of swelling in the study of the properties of vulcanizates. "V. A. Grigorovskaya and V. Ye. Basin participated in the work. The method for determining the weight of the sample was suggested by B. A. Dogadkin and Z. N. Tarasova." Orig. art. has: 4 figures, 2 tables, and 8 formulas.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry)

SUBMITTED: 00

ENCL: 00

SUB CODE: MT

NO REF SOV: 003

OTHER: 004

Card 2/2 *ce*

L 25264-65 EWT(m)/EPF(c)/EPR/ENP(j)/T Pc-4/Pr-4/Ps-4 WW/RM
 S/0138/65/000/001/0009/0012
 ACCESSION NR: AP5002920

36
 34
 B

AUTHOR: Ginzburg, L.V.; Shvarts, A.G.; Shershnev, V.A.; Dogadkin, B.A.

TITLE: Vulcanization of carboxylated rubber with alkylphenol-formaldehyde resin

SOURCE: Kauchuk i rezina, no. 1, 1965, 9-12

TOPIC TAGS: vulcanization, carboxylated rubber, synthetic rubber, phenol formaldehyde resin, alkylphenol polymer, butadiene styrene rubber, methacrylate copolymer, vulcanizate crosslinking, vulcanizate mechanical property, metal oxide, thiuram, oxide filler

ABSTRACT: Vulcanization of SKA-30-1, a carboxylated 70:30 butadiene-styrene copolymer with 1.25% methacrylic acid, was studied with alkylphenol-formaldehyde resin as a vulcanizer in the presence and absence of zinc or magnesium oxides to define the effect of metal oxides on crosslinking and on the mechanical properties and fatigue strength of vulcanizates. Vulcanizates, prepared with 8% resin and 3% magnesium or zinc oxide, without or with admixture of 2% stearic acid, 50% carbon black, KhAF 10% oil extender NP-6, 1% paraffin wax and 2% rosin, were tested for cross-linking by swelling tests and for elasticity, tensile strength, relative elongation and strength after multiple deformation. Vulcanizates with "thiuram" and vulcanizates of SKS-30ARK (modified, 70:30 butadiene-styrene, copolymerized at 5C with rosin soap emulsifier obtained under similar conditions

Card 1/2

L 25264-65

ACCESSION NR: AP5002920

2

were also tested. Alkylphenol-formaldehyde resin was shown to have good activity as a curing agent of carboxylated butadiene-styrene rubber, particularly in the presence of zinc oxide. Magnesium oxide decreased the crosslinking effect. The filled and resin-cured SKS-30-1 had better physical-mechanical properties than thiuram-cured rubber and particularly higher resistance to wear and fatigue. The resin-vulcanized SKS-30-1 rubber showed also less tendency to scorching than conventional SKS-30-1 tire tread mixture and approximately equal physical-mechanical properties. Orig. art. has: 3 figures and 4 tables.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M.V. Lomonosova (Moscow fine-chemical technology institute); Nauchno-issledovatel'nyy institut shinnoy promyshlennosti (Tire industry scientific research institute)

SUBMITTED: 00

ENCL: 00

SUB CODE: MT

NO REF SOV: 005

OTHER: 002

Card 2/2

L 29099-65 EWT(m)/EPF(c)/EWP(j)/T Pc-4/Pr-4 RM

ACCESSION NR: AP5004740

8/0069/65/027/001/0030/0034

AUTHORS: Shvarts, A. G.; Grigorovskaya, V. A.

TITLE: The problem of evaluating the content of cross links in carboxylated rubber vulcanizates ↓

SOURCE: Kolloidnyy zhurnal, v. 27, no. 1, 1965, 30-34

TOPIC TAGS: carboxylation, rubber, sulfur, vulcanizate, benzene, toluene, xylene, hexane, chloroform, carbon tetrachloride, zinc oxide, magnesium oxide/ SKS 30 1 rubber

ABSTRACT: Vulcanization network characteristics of carboxylated rubber were investigated. A method for evaluating cross linkages of various stabilities, starting with the interactions between the μ -carboxylated rubber SKS-30-1, hydrocarbons, and complex esters, was developed. Measurements were made of elongations of nonfilled vulcanizates and others containing oxides of zinc, magnesium, and carbon black after swelling them in vaseline oil, benzene, toluene, m-xylene, n-hexane, chloroform, carbon tetrachloride, dimethyl phthalate, and dibutyl phthalate. The density of the vulcanization network is most completely determined by swelling in dibutylphthalate the carboxylated rubbers containing oxides. Obtained data permit the determination

Card 1/2

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ACCESSION NR: AP5004740

of the function ϕ as

$$\phi = 0,5 f A_0^{-1} V_r^{1/2} \cdot (\lambda - \lambda^{-2})^{-1},$$

where f is the load in grams at which the specimen is stretched to the relative elongation λ ; A_0 is the cross section in cm^2 of the nonswollen specimen; V_r is the share of rubber material in the swollen vulcanizate. Vulcanizates containing magnesium oxide are more resistant to solvents than those with zinc oxide. The authors thank Ye. I. Tinyakova for valuable comments. Orig. art. has: 7 equations, 3 tables, and 1 figure.

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry)

SUBMITTED: 20Apr63

ENCL: 00

SUB CODE: MT

NO REF SOV: 003

OTHER: 003

Card 2/2

L 37728-65 EWT(m)/EPF(c)/EPR/ENP(j) - Pc-4/Pr-4/Ps-4 RM/WW

ACCESSION NR: AP5008901

S/0069/65/027/002/0211/0216

31
28
B

AUTHOR: Kuleznev, V. N.; Shvarts, A. G.; Klykova, V. D.;
Dogadkin, B. A.

TITLE: Physical and mechanical properties of microheterogeneous mixtures of incompatible polymers. Polybutadiene-nitrile rubbers

SOURCE: Kolloidnyy zhurnal, v. 27, no. 2, 1965, 211-216

TOPIC TAGS: incompatible rubber, polybutadiene rubber, nitrile rubber, gum blend, covulcanizate

ABSTRACT: In order to verify the validity of the generally accepted concept that mixtures of incompatible polymers exhibit poorer mechanical properties than their constituents, a study has been made of the properties of mixtures of two typical incompatible polymers as exemplified by polybutadiene (SKD) and nitrile (SKN-18) rubbers. Raw rubbers were mixed on laboratory mills to homogeneous appearance. After the required amounts of curing agents were added to the mixtures, the compounded stocks were covulcanized at 140C for 30 min. Filled covulcanizates were made with 30 parts by weight of

Card 1/152

L 37728-65

ACCESSION NR: AP5008901

channel black. The experiments consisted in the measurement of the viscosity of raw uncompounded SKD and SKN-18 mixtures and in the determination of the cohesive energy density, mechanical properties, and scattering of the strength values of the covulcanizates. It was shown that: 1) for any rubber ratio, the Mooney viscosity of raw unfilled SKD and SKN-18 mixtures is below the additive value; 2) the mixtures have a lower cohesion energy; 3) the mechanical properties of the covulcanizates depend on the rubber ratio (Fig. 1 of the Enclosure); 4) the filler impairs the mechanical properties of the covulcanizates; 5) covulcanizates exhibit a higher fatigue strength than the SKD or SKN-18 vulcanizates (Fig. 2); 6) the scattering of the strength values in covulcanizates is not greater than that in SKD or SKN-18 vulcanizates; 7) the microheterogeneous structure (the result of incompatibility) of polymer mixtures is not necessarily a shortcoming. In some instances, the covulcanizates exhibit better mechanical properties than the vulcanizates of the constituents. Orig. art. has: 5 figures. [BO]

Card 2/5

L 37728-65

ACCESSION NR: AP5008901

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii
im. M. V. Lomonosov (Moscow Institute of Fine Chemical Technology);
Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific
Research Institute of the Tire Industry)

SUBMITTED: 19Feb64

ENCL: 02

SUB CODE: MT

NO REF SOV: 009

OTHER: 001

ATD PRESS: 3224

Card 3/5

GINZBURG, L.V.; SHVARTS, A.G.; SHERSHNEV, V.A.; DOGADKIN, B.A.

Vulcanization of carboxyl-containing rubber with alkylphenol-formaldehyde resin. Kauch.i rez. 24 no.1:9-12 Ja '65. (MIRA 18:3)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M.V.Lomonosova i Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.

SHVARTS, A.G.; GRIGOROVSKAYA, V.A.

Estimation of the cross-link concentration of carboxylated rubber
vulcanizates. Koll. zhur. 27 no.1:30-34 Ja-F '65. (MIRA 18:3)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.

SHVARTS, A.G.

Using the swelling method for the study of the properties of
various rubber types. Kauch. i rez. 2/ no.4:39-43 Ap '65. (MIRA 18:5)

1. Nauchno-issledovatel'skiy institut shinnoy promyshlennosti.

L 56671-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RM
ACCESSION NR: AP5017844

UR/0286/65/000/011/0079/0079
678.7.028.294.044 :
547.563.3

23
3

AUTHOR: Ginzburg, L. V.; Shershnev, V. A.; Shvarts, A. G.; Dogadkin, B. A.;
Neratova, T. N.

TITLE: A method for vulcanizing rubber. Class 39, No. 171570

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 11, 1965, 79

TOPIC TAGS: rubber vulcanization, vulcanization acceleration

ABSTRACT: This Author's Certificate introduces a method for vulcanizing rubber using alkylphenolformaldehyde resins in the presence of accelerators of halide-containing organic substances. The vulcanization process is intensified by using 2,6-dibromodimethyl-4-*tert*-butylphenol as the halide-containing organic substance.

ASSOCIATION: none

SUBMITTED: 19Mar64

ENCL: 00

SUB CODE: MT, GC

NO REF SOV: 000

OTHER: 000

Card 1/1 287

L 11585-66 EWT(m)/EWP(j) RM

ACC NR: AP5028892

SOURCE CODE: UR/0316/65/000/004/0058/0064

AUTHOR: Shvarts, A. G.; Sadykhova, U. K.; Eytngon, I. I.

ORG: AzINEFTEKhIM im. M. Azizbekova

TITLE: Study of vulcanization activity in alkylphenolformaldehyde resins containing methoxy- and bromomethyl terminal groups

SOURCE: Azerbaydzhanskiy khimicheskiy zhurnal, no. 4, 1965, 58-64

TOPIC TAGS: vulcanization, resin, polyformaldehyde plastic, synthetic material

ABSTRACT: The effect of introducing terminal methoxy- and bromomethyl groups to the p-octylphenolformaldehyde resins (BOFFA and OFFA commercial resins) on the mechanical properties of these resins and the rate of vulcanization was studied. The rate of vulcanization was studied with and without $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$ activator. A VR-2 plastometer measured resin viscosity at 110°, 120°, 130°, and 140°C. The degree of resin cross-linking was measured by swelling technique at 140°, 150°, 160°, 170° and 180°C. The vulcanization rate in the bromine-containing resin mixture was 1.8 times greater than that in the methoxy-groups containing resin mixture. The vulcanization accelerating action of the bromomethyl groups was particularly pronounced in the absence of vulcanization activator. Presence of bromomethyl groups also caused an increase in cross-linking. Introduction of the bromomethyl groups was reflected in a general improve-

Card 1/2

L 11585-66

ACC NR: AP5028892

ment in the physicomechanical properties of the commercial p-octylphenolformaldehyde resins. Orig. art. has: 5 figures, 5 tables.

SUB CODE: 11/ SUBM DATE: 14Apr64/ ORIG REF: 006/ OTH REF: 000

HW
Card 2/2

KULEZNEV, V.N.; SEVAST'YAN, A.G.; KULEKOVA, V.D.; DOGADKIN, B.A.

Physical-mechanical properties of microinhomogeneous mixtures
of incompatible polymers. Polybutadiene-butadienenitrile
rubbers. Koll. zhur. 27 no.5:223-226 Mr-Apr '65.

(MIRA 18:6)

1. Moskovskiy institut tekhnicheskoy tekhnologii i inzh-
nerstva: Nauchno-issledovatel'skiy institut shimnoy
promyshlennosti.

MAKAROV, I.V., SHVARTS, A.G., MAKHAROV, N.D., PRIBORITS, I.M.

Determination of the cohesive energy density of some synthetic
rubbers with functional groups. Vysokom. soed. 7 no. 6:1056-1059
Je '65. (MIRA 1849)

1. Yaroslavl'skiy tekhnologicheskiy institut i Nauchno-issledovatel'skiy
institut shinnoy promyshlennosti.

L 42987-66 FMT(π)/FWP(J) IJF(c) RM/JND

ACC NR: AP6013274 (A) SOURCE CODE: UR/0413/66/000/008/0078/0078

INVENTOR: Dogadkin, B. A.; Tutorskiy, I. A.; Shvarts, A. G.; Potapov, Ye. E.; Frolikova, V. G.

ORG: none

TITLE: Method of modifying rubber. Class 39, No. 180790

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 8, 1966, 78

TOPIC TAGS: natural rubber, synthetic rubber, aminophenol, hydroxy compound, aromatic hydroxy compound, rubber modification

ABSTRACT: An Author Certificate has been issued for a method of modifying natural and synthetic rubbers by introducing hexamethylenetetramine and aromatic hydroxy compounds into the mixture. To improve the physical and mechanical properties of the rubber, aminophenols are used as an aromatic hydroxy compound. [Translation] [NT]

SUB CODE: 11,07/ SUBM DATE: 09Jan65/

Card 1/1 hse

UDC: 678.4.7.046-9:547.564.4

L 24483-66 EWT(m)/EWP(j) IJP(c) RM
ACC NR: AP6006988 SOURCE CODE: UR/0190/66/008/002/0357/0360

AUTHORS: Ginzburg, L. V.; Shvarts, A. G.; Shershnev, V. A.; Neratova, T. N. 28 B

ORG: Moscow Institute of Fine Chemicals Technology im. M. V. Lomonosov (Moskovskiy institut tonkoy khimicheskoy tekhnologii)

TITLE: Vulcanization of rubber with products of hydrohalogenation of phenol dimethylol derivatives

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 2, 1966, 357-360

TOPIC TAGS: vulcanization, rubber, chemical reaction kinetics, tracer study

ABSTRACT: Vulcanization of rubber with 2, 6-dibromodimethyl-4-tert-butylphenol (I) and 2, 6-dichlorodimethyl-4-tert-butylphenol (II) was investigated. It was hoped that the reactivity of I and II would prove high enough to make the use of accelerators unnecessary. Compounds I (m.p. 71C) and II (m.p. 68C) were synthesized by passing the corresponding hydrogen halide through a solution of 2,6-dimethylol-4-tert-butylphenol in glacial acetic acid. The kinetics of vulcanization was investigated by using labeling techniques. It was established that the process of vulcanization occurs in two stages: 1) addition, and 2) formation of cross-links.

Card 1/2

UDC: 678.01:54+678.41

L 24483-66

ACC NR: AP6006988

Under the temperature conditions required, the vulcanization is accompanied by evolution of hydrogen halide (60% at 140C) which serves as a "built-in" accelerator of vulcanization. Mechanistic explanations of the reactions are offered. Orig. art. has: 5 figures, 1 equation, and 1 formula.

SUB CODE: 07, 11/ SUBM DATE: 24Mar65/ ORIG REF: 005/ OTH REF: 001

Card 2/2

P.B.

SHVARTS, A.I.

Introducing a semiautomatic press for the vulcanization of
articles in box-type dies. Biul. tekhn.-ekon. inform. Gos.
nauch.-issl. inst. nauch. i tekhn. inform. 18 no.10:10-11
O '65. (MIRA 18:12)

SHVARTS, A.L. (Rostov-na-Donu)

Valvular endocarditis and aneurysm of the principal trunk of the pulmonary artery. Arkh.pat. 18 no.8:82-83 '56. (MLRA 10:2)

1. Iz prozektury (zav. - dotsent A.L.Shvarts) Bel'nitsy neotlozhnoy pomoshchi Rostova-na-Donu (glavnyy vrach A.G.Schastnyy)

(ENDOCARDITIS, complications,

pulmonic endocarditis with aneurysm of pulm artery (Rus))

(ARTERIES, PULMONARY, aneurysm,

with pulmonic endocarditis (Rus))

SHVARTS, A.L.

Experimental formation of the decidual tissue [with summary in English]
Biul.eksp. biol. i med. 46 no.7:101-104 Je '58 (MIRA 11:7)

1. Iz kafedry patologicheskoy fiziologii (zav. - prof. A.N.
Gordiyenko) Rostovskogo-na-Donu gosudarstvennogo meditsinskogo instituta
Predstavlena deystvitel'nym chlenom AMN SSSR V.N. Chernigovskim.
(DECIDUA,

exper. form. in non-pregn. guinea pig (Rus))

SHVARTS, A. L., Doc MED SCI, "ROLE OF ALLERGY IN THE DE-
VELOPMENT OF UTERINE ^{hemorrhages} ~~BLEEDINGS~~." [BAKU], 1961. (AZERBAYD-
ZHAN STATE MED INST IMENI N. NARIMANOV). (KL-DV, 11-61, 226).

-235-

SIVARTS, Anatoliy Leonidovich; GUSAKOVA, A.G., red.; NAZAROVA,
A.S., tekhn. red.

[Battle with the "black doath."] Skhvatka s "chernoi smert'iu."
Moskva, Izd-vo "Znanie," 1961. 63 p. (MIRA 15:8)
(COMMUNICABLE DISEASES—PREVENTION)
(MEDICAL RESEARCH)

SHVARTS, Anatoliy Leonidovich; ZUBKOV, M.A., otv. red.; YEGOROVA,
~~Y.Y.,~~ ~~otv. red.~~

[Code of life] Shifr zhizni. Moskva, Detgiz, 1963. 205 p.
(MIRA 16:10)
(MEDICINE) (MOLECULAR BIOLOGY)

SHVARTS, A.L., dotsent

Allergic mechanism of functional gynecological bleeding. Sbor.
nauch. trud. Rost. gos. med. inst. no.21:229-243 '63.

(MIRA 17:11)

1. Iz kafedry patologicheskoy fiziologii (zav. - prof. A.N. Gordiyenko)
Rostovskogo meditsinskogo instituta i Rostovskogo nauchno-issledovatel'-
skogo instituta akusherstva i pediatrii (dir. - kand. med. nauk D.S.
Baranovskaya); nauchnyy konsul'tant prof. P.Ya. Iel'chuk.

BATYREVA, A.A.; SHVARTS, A.I.

Effect of corticosteroids on the course of experimental tuberculous meningitis. Probl. tub. 42 no.3:65-69 '64.

(MIRA 18:)

J. Rostovskiy-na-Donu nauchno-issledovatel'skiy institut
akusherstva i pediatrii (direktor F.S.Baranovskaya).

1. RODDATIS, K.F.; SHVARTS, A.I., ENG.; LEPESHKIN, A.I., ENG.
2. USSR (600)
4. Steam Boilers
7. Workings of the evaporating zone of high-pressure, uniflow boilers with vertical tube sections. Izv. VTI 21 no.10, 1952.
9. Monthly List of Russian Accessions, Library of Congress, January 1953. Unclassified.

SHVARTS, A. I.

Shvarts, A. I. -- "Investigation of the Downward Movement of a Steam-Water Mixture in Vertical Pipes." Min Electric Power Stations USSR. All-Union Order of Labor Red Banner Heat Engineering Sci Res Inst imeni F. E. Dzerzhinsky. Moscow, 1956. (Dissertation for the Degree of Candidate in Technical Science)

So: Knizhnaya Letopis', No 12, 1956

SHVARTS, A.L., kandidat tekhnicheskikh nauk.; LOKSHIN, V.A., kandidat tekhnicheskikh nauk.

Experimental study of driving pressures in the downward motion of a steam-water mixture in vertical pipes at 180 atm.
Teploenergetika 4 no.6:12-17 Je '57. (MLRA 10:5)

1. Vsesoyuznyy teplotekhnicheskiy institut.
(Steam flow) (Boilers)

SOV/96-59..3-15/21

AUTHORS: Shvarts, A.L., Candidate of Technical Sciences and
Lokshin, V.A., Candidate of Technical Sciences

TITLE: A Method of Determining True Volumetric Steam Contents
and Hydraulic Resistances from Experimental Values of
Effective Circulatory Pressures (Metod opredeleniya
istinnykh ob'yemnykh parosoderzhaniy i gidravlicheskiikh
soprotivleniy iz eksperimental'nykh znacheniy
poleznykh dvizhushchikh naporov)

PERIODICAL: Teploenergetika, 1959, Nr 3, pp 72-75 (USSR)

ABSTRACT: A good deal of experimental data is now available about
effective circulatory pressures in vertical tubes over
the pressure range of 10-220 atm. The data can provide
ways of using measured values of these pressures to give
at least an approximate value of the hydraulic resistances
and true steam contents over a wide range of pressure.
To this end published works about direct measurements of
true steam and gas contents are first analysed. The
results of A.A.Armand are plotted in Fig.1 in the form
of a relationship between the true gas content and the
volumetric gas content for a water/air mixture in a
vertical tube. It will be seen that over most of the

Card 1/3

SOV/96-59-3-15/21

A Method of Determining True Volumetric Steam Contents and
Hydraulic Resistances from Experimental Values of Effective
Circulatory Pressures

range the graph is a straight line. This graph does not cover the range of small flows and accordingly the results of Schwarz, which covers such conditions, have been recalculated in the same coordinates and are plotted in Fig.2. It follows from this graph that for high steam contents the relationship is also approximately linear over most of the range. The departures from linearity are discussed in some detail. By means of formula (2) the lower boundary of linearity may be determined. In selecting a method to determine true steam contents from the pressure values, it is necessary to select a coordinate system which gives a similar straight-line relationship for the hydraulic friction losses, at least to a first approximation. The method of determining friction losses is then explained and, by way of example, data of the Central Boiler-Turbine Institute on effective circulatory pressures are

Card 2/3

SOV/96-59-3-15/21

A Method of Determining True Volumetric Steam Contents and
Hydraulic Resistances from Experimental Values of Effective
Circulatory Pressure

plotted in Fig.3 and 4. Then an expression is derived
for the pressures and its use is explained. There are
4 figures and 5 references of which 4 are Soviet and
1 German.

ASSOCIATION: Vsesoyuznyy teplotekhnicheskii institut (All-Union
Thermo-Technical Institute)

Card 3/3

SOV/96-59-8-20/27

AUTHORS: Lokshin, V.A., Shvarts, A.I., Candidates of Technical Sciences

TITLE: The Calculation of Driving Heads and Hydraulic Resistances During the Motion of a Steam-Water Mixture in Vertical Rising Tubes

PERIODICAL: Teploenergetika 1959, Nr 8, pp 73-77 (USSR)

ABSTRACT: The previous article by the same authors published in Teploenergetika 1959, Nr 3, described a method of calculating true volumetric steam contents and hydraulic resistances from experimental values of useful driving pressures. The method was used to work up experimental data on useful driving pressures within the pressure range of 11 - 220 atm with tube diameters of 25.5 - 56 mm. Curves of the total useful head as a function of steam velocity referred to total tube section were constructed for each series of tests with volumetric steam contents less than 0.91. The method used in the previous article was applied to each series of tests to determine the values of the constants C in equation (6) of the previous article. The values of C

Card 1/4

SOV/96-59-8-20/27

The Calculation of Driving Heads and Hydraulic Resistances During
the Motion of a Steam-Water Mixture in Vertical Rising Tubes

so obtained were used to determine values of true steam content, which were plotted as function of volumetric flow the corresponding curve is plotted in Fig 1 for a pressure of 32 atm and tube diameter of 55.9 mm. Calculations were made of the total driving head: determinations could then be made of the friction losses, and curves were plotted of friction loss as function of flow rate, as exemplified in Figs 2 and 3. This linear relationship may be expressed by formula (1) which includes a coefficient A. To give a better idea of the influences of tube diameter and pressure on the values of C and A, curves of these coefficients as functions of pressure are plotted in Figs 4 and 5: test points are also plotted. It will be seen from Fig 4 that the relationship between C and the pressure is not a simple one. The curves of Fig 5 show that the frictional loss formula currently used is not valid at very high pressures, particularly when tubes are of small diameter. The procedure to be adopted when the volumetric meter. The procedure to be adopted when the volumetric steam content is greater than 0.91 is discussed, and a

Card 2/4

SOV/96--59--8--20/27

The Calculation of Driving Heads and Hydraulic Resistances During
the Motion of a Steam-Water Mixture in Vertical Rising Tubes

typical curve of true steam content as a function of volumetric steam content for a pressure of 62 atm is given in Fig 6. True steam velocity as a function of mixture velocity for a pressure of 62 atm is plotted in Fig 7. Further numerical examples are worked out, and it is concluded that a formula similar to equation (8) may be used in all cases of motion of a steam-water mixture in vertical rising pipes to determine the value of the true steam content. The constant C in this formula may be taken from the nomogram in Fig 9. Finally, equation (9) is given for calculations of useful driving heads, total driving heads and hydraulic resistances during motion in a vertical rising tube of steam-water mixtures of various steam contents at pressures up to the sub-critical. In equation (9) the coefficient C is determined from the nomogram of Fig 9 and the coefficient A from Fig 5, depending on the mixture pressure. Limitations on the use of the nomogram are explained. Values of useful driving heads calculated by means of the nomogram

Card 3/4

SOV/96-59-8-20/27

The Calculation of Driving Heads and Hydraulic Resistances During
the Motion of a Steam-Water Mixture in Vertical Rising Tubes

were found to be in good agreement with experimental values,
as will be seen from the graph in Fig 10, which relates to
a pressure of 111.5 atm and tube diameter of 25.5 mm.
There are 10 figures and 3 Soviet references.

ASSOCIATION: Vsesoyuznyy teplotekhnicheskii institut (The All-Union
Thermo-Technical Institute)

Card 4/4

KAGAN, D.Ya., kand. tekhn.nauk; SHVARTS, A.L., kand. tekhn. nauk

Damage of the heating surfaces of uniflow boilers equipped with
vertical water walls. Elek. sta. 30 no.3:16-19 Mr '59.

(MIRA 12:5)

(Boilers)

SHNEYEROVA, R.I., inzh.; SHVARTS, A.L., kand.tekhn.nauk; MIROPOL'SKIY,
Z.L., kand.tekhn.nauk; LOKSHIN, V.A., kand.tekhn.nauk

Experimental study of the real steam contents and useful heads
in tilted pipes. Teploenergetika 8 no.4:63-67 Ap '61.

(MIRA 14:8)

1. Energeticheskiy institut AN SSSR i Vsesoyuznyy teplotekhnicheskiy
institut.

(Boilers)

639

AUTHOR: Shvarts A.L. and Lokshin, V.A., Candidates of Technical Sciences (All-Union Thermotechnical Institute).

TITLE: Experimental investigation of moving heads during downward movement of a steam-water mixture in vertical tubes at pressures up to 180 atm. (Eksperimental'noye issledovaniye dvizhushchikh naporov pri opusknom dvizhenii parovdyanoy smesi v vertikal'nykh trubakh pri davleniyakh do 180 at.)

PERIODICAL: "Teploenergetika" (Thermal Power), 1957, Vol. 4, No. 6, pp. 12 - 17 (U.S.S.R.)

ABSTRACT: A recent investigation into the reversal of circulation in a multitube circuit with natural circulation at a pressure of 12 atm. makes it possible to represent the circulation characteristics of the tubes in the left quadrant of the circulation diagram. This left quadrant corresponds to a negative flow of water and has two branches. The righthand branch is a continuation of the circulation characteristic of the tubes in the region of small positive water flows and corresponds to downward movement of water combined with upward movement of steam. The left branch of this quadrant is the circulation characteristic corresponding to downward movement of the steam-water mixture when both phases are moving in the same direction.

Until now experimental data for the construction of the branch of the circulation characteristic corresponding to

Card 1/7

039

Experimental investigation of moving heads during downward movement of a steam-water mixture in vertical tubes at pressures up to 180 atm. (Cont.)

downward movement of the mixture was limited to tests carried out in the Central Boiler and Turbine Institute by D.F. Peterson and O.M. Baldina in 1937 at a pressure of 10 atm. with high steam contents in the mixture.

The present work is mainly devoted to the determination of so-called useful heads corresponding to this lefthand branch of the circulation characteristic over the pressure range of 35 to 180 atm. Besides this, measurements were carried out to study the special features of the structure of the downward flow of steam-water mixture and to determine the limiting speed of circulation with downward movement of the water (at which a bubble remains stationary and above which both liquid and gaseous components move together). This critical circulation speed approximately characterises the beginning of the left branch of the circulation characteristic of the tube in the left hand quadrant of the circulation diagram.

The experimental rig is described. It is connected to two steam mains, one at a pressure of 300 atm. and a temperature of 600 °C and the other at 130 atm. and 500 °C. The water was prepared by condensing part of the steam delivered to the rig in a special steam cooler with an output of 3 tons/h.

After leaving the cooler the condensate passed into a contact heater of the flow type where it was heated by steam to the necessary temperature. Appropriate controls are

Card 2/7

Experimental investigation of moving heads during downward
movement of a steam-water mixture in vertical tubes at
pressures up to 180 atm. (Cont.) ⁶³⁹

provided to achieve the desired steam conditions.

After throttling, the steam-water mixture passed to separators from which the water passed to coolers and then on to the condensate tank whilst the steam was discharged into the atmosphere. The rig was modified during different stages of the work. In the first stage the useful heads were determined during downward flow in a pipe of 42/29 mm dia. on two independent sections located one below the other. The next stage included a new experimental section of diameter 70/55 mm for determination of useful heads of downward flow, having independent tapping of pressure drop on two parallel differential manometers. The limiting speed of steady downward flow of the mixture was determined on two glass, water-air models of 26 and 55 mm diameter. Air from a compressor at a pressure of 280 atm. was supplied to the pipe through a nozzle, the quantity of water delivered to the tube was adjusted so that the air bubbles remain stationary.

Two runs were made to determine the heat loss through the insulation of the rig to the surrounding medium and one to determine the heat absorption from the surrounding medium for the calorimeter-cooler. The steps that were taken to ensure

Card 3/7

639

Experimental investigation of moving heads during downward movement of a steam-water mixture in vertical tubes at pressures up to 180 atm. (Cont.)

accuracy of the results are described.

The working-up of the experimental data on the moving heads consisted of determination of the speed of circulation, of the referred speed of the steam and of the total resistance with downward movement of the steam-water mixture, which we called the negative useful moving head, by analogy with rising movement. This terminology is advisable because in the circulation diagram the values of the useful heads and 'negative' useful heads are laid out on one and the same ordinate axis and in the latter case the heads correspond to negative flow of water, i.e. the downward flow.

Formulae are given for the rate of circulation, the enthalpy, and the negative useful moving heads.

Tests to determine the useful heads of downward flow of a steam-water mixture in a pipe of 29 mm internal diameter were carried out at pressures of 35, 100, 140 and 180 atm. and circulation speeds of 0.3, 0.5, 0.75, 1 and 1.5 metres/sec in the range of flows with the steam content of the mixture from 0 to 0.97 by volume; also on a pipe of internal diameter 55 mm at pressures of 35 and 100 atm. at circulation speeds of 0.3, 0.5, 0.6 and 0.7 metres/sec when the pressure is 35 atm. with the same range of steam content.

Experimental data on the useful head of downward flow for

Card 4/7

639

Experimental investigation of moving heads during downward movement of a steam-water mixture in vertical tubes at pressures up to 180 atm. (Cont.)

the 29 mm pipe at $p = 140$ atm. is given in Fig. 4 and the corresponding figures for 55 mm tube at 100 atm. in Fig. 5. These figures show that, as with rising motion of the steam-water mixture, there are two regions of the relationship between the useful head and the referred steam speed at constant pressure.

For small values of referred steam speed there is a sharp increase in the useful head with the referred speed, then the curve bends over and becomes flatter. This reflects the nature of the relationship between the volume and weight steam contents. However, unlike the case of rising movement of steam water mixture with downward movement there is an intersection of the curves of negative useful moving heads relating to different speeds of circulation.

The experimental data obtained make possible for the first time the construction of the left branch of the circulation characteristic of the left hand quadrant of the circulation diagram over the pressure range from medium to super-high. By way of example, Fig. 6 gives curves of these characteristics for tubes with an internal diameter of 29 mm at a pressure of 100 atm.

A mathematical expression is given that represents the results

Card 5/7

Experimental investigation of moving heads during downward
movement of a steam-water mixture in vertical tubes at
pressures up to 180 atm. (Cont.)

639

of tests on the determination of enthalpy (i.e. steam content)
at the centre of the downward flow. The relationship is also
plotted on graphs in Figs. 7 and 8 for 29 mm tubes at 35 and
100 atm., respectively.

The tests carried out on samples taken from the central part
of the downward flow made it possible to establish that at low
and moderate steam contents the centre of the downward flow is
free of bubbles. In a flow of steam-water mixture moving down-
wards in a vertical tube the centre is the place with a maxi-
mum concentration of steam bubbles. Only at large volume
steam contents in the central part of the flow is the steam
content equal to the total steam content of the mixture.

Determination of the critical speed of circulation for
downward flow of a two-phase mixture, corresponding to the gas
bubbles being stationary, was carried out on air water models
of 26 and 48 mm diameter. For both diameters of pipe the speed
was the same and for larger bubbles was 0.2 metres/sec and for
small bubbles (3 - 5 mm dia.) 0.16 m/sec, which is in satis-
factory agreement with published data. The rate of downward
flow of water at which the bubbles remain stationary is close
to the rate at which bubbles rise in the tube in still water.
At water speeds somewhat above the critical value the rate of
movement of bubbles was determined by measuring the time
required for bubbles of a definite size to pass between upper

Card 6/7

639
Experimental investigation of moving heads during downward movement of a steam-water mixture in vertical tubes at pressures up to 180 atm. (Cont.)

and lower marks on the tube. The tests were carried out for single bubbles and for groups of bubbles and the results are given on Fig. 9. The graphs show that at circulation speeds less than 0.4 m/sec there is sluggish carry-over of bubbles and therefore even a small quantity of steam entering the tube causes it to have a large true steam content which in a contour with natural circulation can interrupt downward flow of mixture in the tube. Therefore, although the steady rate of circulation of flow in a downward tube in which a mixture of given steam content is flowing is determined by the circulation characteristic of the tube and the magnitude of the useful head of the given circuit, it may be concluded that steady downward flow of the mixture is hardly likely to occur at circulation speeds less than 0.4 m/sec (at low and medium pressures). This speed should be established more accurately for high and super-high pressure steam-water mixtures.

9 figures, 2 Russian literature references.

Card 7/7

PETROSYAN, R.A., kand. tekhn. nauk; SHVARTS, A.L., kand. tekhn. nauk;
BULGAKOVA, N.V., inzh.; SHMUKLER, B.I., inzh.; DEMB, E.P., inzh.

Study of the sliding start conditions of a cold PK-33 once-through
type boiler unit with nondraining shield-type superheater.
Teploenergetika 10 no.9:19-25 S '63. (MIRA 16:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy teplotekhnicheskii
institut im. Dzerzhinskogo i zavod imeni Ordzhonikidze.
(Boilers)

SHNEYEROVA, R.I., inzh.; SHVARTS, A.L., kand. tekhn. nauk;
MIROPOL'SKIY, Z.L., kand. tekhn. nauk; LOKSHIN, V.A., kand.
tekhn. nauk

Hydraulic resistance in the upward motion of a steam and water
mixture in inclined pipes. Teploenergetika 11 no.7:24-26
Jl '64. (MIRA 17:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy teplotekhnicheskiy
institut i Energeticheskiy institut im. Krzhizhanovskogo
AN SSSR.

SHVARTS, A.L., kand. tekhn. nauk; KUZ'MIN, V.V., inzh.

Hydraulic characteristics of the heating surfaces of once-through
type boilers with supercritical steam parameters. Elek sta 36
no.4:14-20 Ap '65. (MIRA 18:6)

SHVARTS, A. M.

Dissertation: "The Theoretical and Experimental Basis of the Methods for Reducing the Consumption of Lubricants in Internal-Combustion Autotractor Engines." Cand Tech Sci, Joint Sci Council of the All-Union Sci Res Inst for the Mechanization of Agriculture (VIM) and the All-Union Sci Res Inst for the Electrification of Agriculture (VIESKh), 15 Jun 54. (Vechernyaya Moskva, Moscow, 4 Jun 54)

SO: SUM 318, 23 Dec 1954

SHVARTS, A.M., inzh.

French commercial shipbuilding. Sudostroenie 25 no.6:47-48 Je
'59. (MIRA 12:9)

(France--Shipbuilding)

SHVARTS, A.M., kand.tekhn.nauk

Automatic control system for fuel supply to inlet pipe. Avt.prem.
28 no.5:41-43 My '62. (MIRA 15:5)
(Motor vehicles--Fuel systems) (Automatic control)

SHVARTS, A. M.

"Parkinsonism in Tick-Borne Encephalitis," by A. M. Shvarts, Trudy Tomskogo Nauchno-Issledovatel'skogo Instituta Vaktsin i Syvorotok (Works of the Tomsk Scientific Research Institute of Vaccines and Sera), Vol 6, 1955, pp 72-74 (from Sovetskoye Meditskoye Referativnoye Obozreniye, No 15, 1956, p 29, abstract by K. Gorbunova)

"The author describes four cases of parkinsonism in patients in whose anamnesis a typical picture of acute tick-borne encephalitis was noted. The diagnosis of tick-borne encephalitis was verified serologically in one of the patients. Parkinsonism arose during the acute period of encephalitis in three patients, but was not sharply expressed; phenomena of parkinsonism were intense for 9 years after the acute period in one patient." (U)

Sum. 1391

SHVARTS, A. M.

"The Study of Influenzal Affections of the Nervous System,"
by M. A. Mistenitsa and A. M. Shvarts, Trudy Tomskogo Nauchno-
Issledovatel'skogo Instituta Vaktsin i Syvorotok (Works of the
Tomsk Institute of Vaccines and Sera) Vol 6, 1955, pp 144-148
(from Sovetskoye Meditsinskoye Referativnoye Obozreniye, No
15, 1956, p 26, abstract by K. Gorbunova)

"Ninety-four patients admitted with diagnoses of arachnoiditis, meningitis, meningoencephalitis, neuritis, and paralysis were examined. The patients were examined at varying lengths of time after the onset of the disease. Upon laboratory investigation, in A type virus influenza was found to play a part in the disease in 16 patients, specific influenzal antigens were observed in four patients, an antibody titer increase in ten, and influenza antigen and an increase in antibody titer in two. Conclusion: meticulous investigation of the nervous system in influenza patients, and laboratory investigations for influenzal infections in all patients with inflammatory-type affection of the nervous system of undetermined etiology are necessary." (U)

Sum. 1391

SHVARTS, A.M.; TRAKHTENGERTS, E.A.; BRUK, B.N.; PURTO, V.A.;
FISHKINA, V.L.

Experience in literal translation of patent literature
from the English language by the "Strela-3" computer.
NTI no.2:42-45 '63. (MIRA 16:11)

SHVARTS, A.S., arkhitekt; KUKUNOV, P.M., inzh.; DOBRYNIN, S.N., inzh.;
DRAMPOV, V.K., inzh.; KHLUSOV, I.Ye., kand.tekhn.nauk; POVALYAYEV,
M.I., kand.tekhn.nauk; SHOLOKHOV, V.G., inzh.; TEMKIN, L.Ye., inzh.,
red.; STRASHNYKH, V.P., red.izd-va; GOL'BERG, T.M., tekhn.red.

[Temporary instructions for designing and constructing flat
tar-paper roofs of industrial buildings] Vremennye ukazaniya po
proektirovaniyu i ustroistvu ploskikh tolevykh krovvel' zdaniy
promyshlennyykh predpriyatii SN 112-60. Moskva, Gos.izd-vo lit-ry
po stroit., arkhitekt. i stroit.materialam, 1961. 23 p.

(MIRA 14:6)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam stroi-
tel'stva. 2. Promstroyproekt (for Shvarts, Kukunov, Dobrynin,
Drampov). 3. Nauchno-issledovatel'skiy institut stroitel'noy fiziki
i ogranichayushchikh konstruktsiy Akademii stroitel'stva i arkhitektury
SSSR (for Khlusov, Povalyayev, Sholokhov). (Roofs)

SHVARTS, A.S., kand.tekhn.nauk; BLAGOVESTOV, B.K., inzh.

Organization of exemplary workshops in Leningrad shoe
factories. Kozh.-obuv.prom. no.10:1-2 O '59. (MIRA 13:2)
(Leningrad--Shoe industry)

SHVARTS, A.S., kand.tekhn.nauk; SMIRNOV, M.D., inzh.

From integrated to semiautomatic production lines in shoe
manufacture. Kozh.-obuv.prom. 2 no.1:5-8 Ja '60. (MIRA 13:5)
(Shoe manufacture) (Assembly-line methods)

SHVARTS, A. S.

USSR/Mathematics - Topology, Neighborhood
Jul/Aug 53

"Geometry of Neighborhoods, Uniform Geometry, and Topology," N. S. Ramm and A. S. Shvarts, Ivanovo State Pedagog Inst

Mat Sbor, Vol 33 (75), No 1, pp 157-180

Continuation of V. A. Yefremovich's work ("Non-equivalence of Euclidean and Lobachevskian Spaces," Usp Mat Nauk, Vol 4, No 2 (30), 1949). Demonstrate almost all of the results of Yu. M. Smirnov's work ("Spaces of Neighborhoods," Mat Sbor, Vol 31 (73),

271T86

1952) by other, often simpler, ways. Further, investigate the interconnection of a number of infinitesimal concepts with the concept of neighborhood permits one to simplify considerably the proof of the principal theorems of bicomact extensions. Presented 17 Sep 52.

271T86

SHVARTS, A. S.

USSR/Mathematics - Spaces

21 Mar 53

"New Definition of Uniform Spaces. Metrization of Spaces of Proximity," V. A. Yefimovich and A. S. Shvarts

DAN SSSR, Vol 89, No 3, pp 393-396

Discuss 3 possible ways to axiomatize the concept of uniform continuity: (1) through relation of infinite closeness of two sets ($A B = p(A, B) = 0$ in metric space) a development of the viewpoint of P. Aleksandrov and K. Kuratovskiy; (2) through uniform systems of neighborhoods (axiomatization of a system of epsilon-neighborhoods in metric space), a development of

272T56

F. Hausdorff's viewpoint; (3) through relation of equivalences of generalized sequences $x_n \sim y_n$ (generalization of converging sequences in metric space, with $x_n \sim y_n$ meaning $p(x_n, y_n) \rightarrow 0$), a development of M. Frechet's viewpoint. Presented by Acad A. N. Kolmogorov 24 Jan 53.

SHVARTS, A.S. (Ivanovo).

Metric order of closed sets in Euclidean space. Mat.sbor. 36
no.2:263-270 Mr-Apr '55. (MLRA 8:6)
(Aggregates) (Topology)

SHVARTS, A.S.

Svarc, A.S. On the metric order of closed sets of Euclidean n -space. Mat.-Sb. N.S. 36(78), 263-270 (1955). (Russian) F/W

115 Suppose that A is a finite subset of a compact metric space F . If x is a point of F , the order of x relative to A is the number of points of A at a minimum distance to x . The order of A relative to F is the maximum of the orders of points x relative to A . The space F is of order n if for each $\epsilon > 0$ there is an ϵ -net (a finite set, ϵ -dense in F) in F of order n and if for some $\epsilon > 0$, every ϵ -net is of order $\geq n$. If $\omega(F)$ is the metric order, then $\omega(F) \geq \dim F + 1$. F is metrically correct if equality holds. The purpose of the paper is to prove two theorems. (1) Every dimensionally homogeneous $(n-1)$ -dimensional curved polyhedron in n -space E^n is metrically correct. (2) If $F \subset E^{n+1}$ and F is a compact space of dimension n , then there is an isotopy f_t of F in E^{n+1} such that each $f_t(F)$, $0 < t \leq 1$, is metrically correct. These theorems are related to theorems of Sitnikov [Dokl. Akad. Nauk SSSR (N.S.) 67, 229-232 (1949); MR 11, 121].
E. E. Floyd (Charlottesville, Va.).

LPH

SHVARTS, A. S.

3

Shvarts, A. S. Homologies of the spinor group. Dokl. Akad. Nauk SSSR (N.S.) 104 (1955), 26-29. (Russian)

The author announces the result that the algebra $H^*(\text{Spin}(n), \mathbb{Z}_2)$ has a primitive system of generators if and only if $n \leq 9$ or $n = 2^k + 1$ (k positive integer), and the Pontrjagin ring of $\text{Spin}(n)$ mod 2 is a Grassmann algebra if and only if $n \leq 9$ or $n = 2^k + 1$. The statement for $n = 2^k + 1$ contradicts an announcement of Borel [Amer. J. Math. 76 (1954), 273-342, p. 326; MR 16, 219].

The main tool in proving the present results is the twofold covering of the Whitehead-Miller complex which has been employed also by Araki [Mem. Fac. Sci. Kyûsyû Univ. Ser. A. 9 (1955), 1-35; MR 17, 11]. The reviewer has not been able to check all the details since many of them are only indicated. Further, the author describes a class of primitive generators in the weak homology of $\text{Spin}(n)$ which is connected with a similar system for $\text{SO}(n)$ described by Dynkin [Uspehi Mat. Nauk (N.S.) 8 (1953), no. 5(57), 73-120; MR 15, 601].

W. T. van Est (Utrecht).

1 - F/W

Handwritten signature

SHVARTS, A.S.

Dimensional invariant of coverings. Dokl. AN SSSR 105 no.1:
32-34 N '55. (MLRA 9:3)

1. Ivanovskiy gosudarstvennyy pedagogicheskiy institut.
Predstavleno akademikom P.S. Aleksandrovym.
(Topology)

SHVARTS, A. S.

Call Nr: AF 1108825

Transactions of the Third All-union Mathematical Congress *(Cont.) Moscow
Jun-Jul '56, Trudy '56, V. 1, Sect. Rpts., Izdatel'stvo AN SSSR, Moscow, 1956, 237 pp.
Shvarts, A. S. (Moscow). Volume Invariant of Coverings 137

Mention is made of Yefremovich, V. A.

There are 2 references, both of them USSR.

138-178

Section of Geometry

Reports by the following personalities are included:

Ayzenshtat, N. D. (Moscow). Vaynshteyn, I. A. (Moscow),
Kreynev, M. A. (Moscow). Nomography of Functions
Defined on Nets. 138

Bakel'man, I. Ya. (Leningrad) Evaluation Deformation
of a Convex Surface. 138

Bakhvalov, S. V. (Moscow) and Zidkov, N. P. (Moscow).
Approximate Solution of the Direct Geodesic Problem. 138-140

Card 45/80

*

Shvarts, A.S.

44-1-264

TRANSLATION FROM: Referativnyy zhurnal, Matematika, 1957, Nr. 1,
p 39, (USSR)

AUTHOR: Shvarts, A.S.

TITLE: The Homologies of Several Mapping Spaces
(Gomologii nekotorykh prostranstv otobrazheniy)
Tr. 3-go Vses. matem. s"yezda, 2, Moscow, AN SSSR,
1956, p 137

PERIODICAL:

ABSTRACT:

The author maintains that the method of spectral sequences allows the computation of homological spaces of closed paths of a singly-connected compact manifold, whence, in particular, ensues the Lusternik-Foet theorem on the existence of a closed geodetic curve.

Card 1/1

Shvarts, A.S.

44-1-263

TRANSLATION FROM: Referativnyy zhurnal, Matematika, 1957, Nr 1,
p 39 (USSR)

AUTHOR: Shvarts, A.S.

TITLE: The Homologies of Spaces of Closed Curves on Spheres
(Gomologii prostranstv zamknutykh krivyykh na sferakh)

PERIODICAL: Tr. 3-go Vses. matem. s"yezda, 2, Moscow, AN SSSR,
1956, p. 137

ABSTRACT: The author maintained that the present computation
by Morse of the type of numbers mod 2
of the undegenerate closed geodetic curve is,
generally speaking, wrong for the multiple geodetic
curve. However, the type of numbers of the
undegenerate geodetic curve in the field of rational
numbers is always equal to zero, with the possible
exception of the value one.

Card 1/1

~~SHVARTS, A. S.~~

Proximity spaces and structures. Uch. zap. Ivan. gos. ped. inst.
10:55-60 '56. (MLBA 10:4)
(Topology)

SHVARTS, A.S.

Evaluating the species of a topological space in the sense of
Krasnosel'skii. Usp.mat.nauk 12 no.4:209-214 J1-Ag '57.
(MIRA 10:10)

(Topology)

SHVARTS, A.S.

One of Sikorskii's problems. Usp.mat.nauk 12 no.4:215 J1-Ag '57.
(MIRA 10:10)

(Topology)

20-114-3-11/60

AUTHORS: Rokhlin, V. A., Shvarts, A. S.

TITLE: On the Combinatorial Invariance of the Pontryagin Classes
(O kombinatornoy invariantnosti klassov Pontryagina)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 114, Nr 3, pp. 490-493 (USSR)

ABSTRACT: The present paper proves the combinatorial invariance of the reduced Pontryagin-classes p_{4k} , i.e. the characteristic Pontryagin-classes which may be considered as classes of the weak ∇ -homologies. The present paper is closely connected with the paper by V. A. Rokhlin, Doklady Akademii Nauk SSSR, 1957, Vol. 113, Nr 2. When φ is a continuous representation, the corresponding homomorphisms of the groups of the ∇ - and Δ -homologies are designated by φ^* and φ_* . Main theorem: Let M_0^n, M_1^n be smooth closed manifolds with the isomorphous C^1 -triangulations K_0 and K_1 and $\rho: M_0^n \rightarrow M_1^n$ be an isomorphous representation which may be defined by a certain isomorphism between K_0 and K_1 . Then $\varphi^*(p_{4k}(M_1^n)) = p_{4k}(M_0^n)$ ($k=1,2,\dots$)

Card 1/3

20-114-3-11/60

On the Combinatorial Invariance of the Pontryagin Classes

applies. From this the following corollary arises: When the smooth closed orientable manifolds M_0^{41} , M_1^{41} have isomorphic C^1 -triangulations, at a suitable orientation they have equal Pontryagin-numbers. From the main theorem follows: When the main hypothesis of the combinatorial topology is correct, the Pontryagin-numbers are topologically invariant. When the stronger main hypothesis is correct, the reduced Pontryagin-classes are topologically invariant. Then two lemmata are given and proved, and after those the proof of the main theorem is given. Finally the authors examine the manifolds B_k^8 and X_k^8 constructed by Milnor. L_k^8 be the triangulation of the second manifold obtained from a certain C^1 -triangulation of the first manifold. L_k^8 is a formal manifold. Then the following theorem is proved: At $k \not\equiv 1 \pmod{7}$ the closed orientable manifold L_k^8 does not permit any smoothness and besides it is not internally homologous to the smooth manifold. The following corollary is obtained: When the main hypothesis of the combinatorial topology is the case, no smoothness can be introduced into the topological manifold X_k^8 . There are 8 references, 2 of which are Soviet and 6 French.

Card 2/3

20-114-3-11/60

On the Combinatorial Invariance of the Pontryagin-Classes

ASSOCIATION: State Pedagogical Institute, Ivanovo (Ivanovskiy gosudarstvennyy pedagogicheskiy institut)

PRESENTED: February 2, 1957, by P. S. Aleksandrov, Member of the Academy

SUBMITTED: January 30, 1957

Card 3/3